IN THE CLAIMS

1. (Currently Amended): An apparatus for performing beamforming on a plurality of signals in a reception channel received from a receiving antenna array, said signals including simultaneous data signals from a plurality of transmitters, said circuit comprising:

an Nx1 switched beam beamforming circuit for weighting and combining outputs of N antenna receiving elements to generate a plurality of beam signals and selecting for output a single beam signal therefrom based on a beam scheduling sequence, wherein N is an integer greater than 1;

a beam schedule generating circuit for generating said beam scheduling sequence used by said Nx1 switched beam beamforming circuit for switching between ones of said plurality of beam signals for output;

a frequency downconverting circuit for converting said selected single beam signal to a baseband signal; and

a multi-path/multi-user estimation circuit for generating from said baseband signal path estimates and path estimate errors for each of said simultaneous data signals.

2. (Original): The apparatus of claim 1 further comprising an analog-to-digital converter between said frequency downconverting circuit and said multi-path/multi-user estimation circuit and wherein said multi-path/multi-user estimation circuit comprises a

digital signal processor.

3. (Original): The apparatus of claim 2 wherein said beam schedule generating circuit is adapted to generate said beam scheduling sequence by determining a minimum mean square error estimation of a state-space model of said reception channel.

4. (Currently Amended): The apparatus of claim 3 wherein said beam schedule generating circuit switches said selected single beam signal at a rate faster than a data rate of said signals in said reception channel.

5. (Currently Amended): The apparatus of claim 3 wherein said apparatus is adapted to receive spread spectrum signals, said spread spectrum signals having a chip rate, and wherein said ~~control~~ Nx1 switched beam beamforming circuit switches said selected single beam at said chip rate.

6. (Original): The apparatus of claim 5 wherein said spread spectrum signals are code division multiple access signals.

7. (Original): The apparatus of claim 6 wherein said code division multiple access signals are direct sequence-code division multiple access signals.

8. (Previously Presented): The apparatus of claim 4 wherein said beam schedule generating circuit revises said beam scheduling sequence at predetermined intervals, said beam schedule generating circuit controlling said Nx1 switched beam beamforming circuit in accordance with repetitions of a given beam scheduling sequence until revised.

9. (Previously Presented): The apparatus of claim 8 further comprising a memory and wherein said beam schedule generating circuit stores each beam scheduling sequence in said memory and retrieves said beam scheduling sequence from said memory to be used for controlling said Nx1 switched beam beamforming circuit during a period said beam scheduling sequence is used.

10. (Cancelled).

11. (Original): The apparatus of claim 10 wherein $P_{G-1G-1}(F_{G-1})$ is determined by running a Kalman filter.

12. (Cancelled).

13. (Previously Presented): A method for performing beamforming on a plurality of signals in a reception channel received from a receiving antenna array, said signals including simultaneous data signals from a plurality of transmitters, said method comprising the steps of:

(1) weighting and combining outputs of N antenna receiving elements and generating a plurality of beam signals and selecting for output a single beam signal therefrom based on a beam scheduling sequence, wherein N is an integer greater than 1;

(2) generating said beam scheduling sequence used in step (1) for switching between ones of said plurality of beam signals as the selected single beam signal;

(3) converting said selected single beam signal to a baseband signal; and

(4) generating path estimates and path estimate errors for each of said simultaneous data signals from said baseband beam signal.

14. (Previously Presented): The method of claim 13 further comprising the step of converting said selected single beam signal from analog to digital between steps (3) and (4).

15. (Original): The method of claim 14 wherein step (2) comprises generating said beam scheduling sequence by determining a minimum mean square error estimation of a state-space model of said reception channel.

16. (Previously Presented): The method of claim 15 wherein step (2) comprises switching between said plurality of beam signals at a rate faster than a data rate of said signals in said reception channel.

17. (Previously Presented): The method of claim 15 wherein said signals in said reception channel are spread spectrum signals, said spread spectrum signals having a chip rate, and wherein step (2) comprises switching between said plurality of beam signals at said chip rate.

18. (Original): The method of claim 17 wherein said spread spectrum signals are code division multiple access signals.

19. (Original): The method of claim 18 wherein said code division multiple access signals are direct sequence-code division multiple access signals.

20. (Previously Presented): The method of claim 16 wherein step (2) comprises

(2.1) revising said beam scheduling sequence at predetermined intervals; and

(2.2) using each given beam scheduling sequence repetitively until said beam scheduling sequence is revised.

21. (Previously Presented): The method of claim 20 further comprising the steps of:

(5) storing each beam scheduling sequence in a memory; and

(6) retrieving said beam scheduling sequence from said memory to be used for switching between ones of said plurality of beam signals for output during a period said beam scheduling sequence is used.

22. (Cancelled).

23. (Currently Amended): The method of claim 22 wherein step (2) further comprises determining ~~$P_{G-1G-1}(F_{G-1})$~~ $\underline{P_{G-1|G-1}(F_{G-1})}$ by running a Kalman filter.

24. (Cancelled).

25. (Previously Presented): The apparatus of claim 5 wherein said beam schedule generating circuit generates said beam scheduling sequence by solving

$$\hat{F}_{G-1} = \arg\max_{F_{G-1}} Tr\{JP_{G-1G-1}(F_{G-1})\};$$

and setting

$$\hat{f}_k = \hat{\hat{f}}_k, for\ k = 0,1,\ldots,G-1$$

wherein

k is a time index;

$\hat{f}_k$ is the time varying switch-beamforming vector based on a closed loop control function;

$\hat{\hat{f}}_k$ is the time varying switch-beamforming vector based on an open loop control function;

$\hat{F}_{G-1} = (\hat{f}_0, \hat{f}_1, \ldots, \hat{f}_{G-1})$;

G is the processing gain;

J is a weighting matrix; and

$P_{G-1|G-1}F_{G-1}$ is the error covariance matrix.

26. (Previously Presented): The method of claim 17 wherein step (2) comprises generating said beam scheduling sequence by solving:

$$\hat{F}_{G-1} = \arg\max_{F_{G-1}} Tr\{JP_{G-1G-1}(F_{G-1})\};$$

and setting

$$\hat{f}_k = \hat{\hat{f}}_k, for\ k = 0, 1, \ldots, G-1$$

wherein

k is a time index;

$\hat{f}_k$ is the time varying switch-beamforming vector based on a closed loop control function;

$\hat{\hat{f}}_k$ is the time varying switch-beamforming vector based on an open loop control function;

$\hat{F}_{G-1} = (\hat{f}_0, \hat{f}_1, \ldots, \hat{f}_{G-1})$;

G is the processing gain;

J is a weighting matrix; and

$P_{G-1|G-1}F_{G-1}$ is the error covariance matrix.